

REMARKS

Status

Claims 1-18 were at issue in this Office Action. The present response cancels claims 3, 4 and 6. Accordingly, it is now claims 1, 2, 5 and 7-18, as amended, which are at issue.

The Office Action

In the Office Action mailed November 17, 2008, claims 1-18 were rejected. Specifically, claims 1, 2, 6-8 and 14 were rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent 2,901,109 of Eppenberger. Claims 1-3, 5-10, 14 and 18 were rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent 4,322,288 of Schmidt.

Claims 1-6, 9-12 and 14 were rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent 6,530,482 of Wiseman. Claims 13, 16 and 17 were rejected under 35 U.S.C. §103 as being unpatentable over Wiseman '482 and further in view of WO 03/013690 (US 7,216,768 equivalent). Claim 15 was rejected under 35 U.S.C. §103 as being unpatentable over Wiseman '482 and further in view of U.S. Patent 5,593,582 of Roff and U.S. Patent 4,319,990 of Muller.

Claims 1-18 were rejected under 35 U.S.C. §112, second paragraph, with regard to particular noted informalities, and the Examiner objected to the information disclosure statement.

Applicant thanks the Examiner for the search, for the Office Action, and for the thorough explanation of the basis of the rejections.

Amendments to the Claims

The claims are amended as follows.

Claim 1 is amended to include the features of previously pending claims 3 and 4 and is now directed to a basket having a stack of at least three screen assemblies, the screen assemblies being provided with a flow distributor which is switchable between a plurality of different flow

directing configurations. These different flow directing configurations include a parallel processing configuration as previously recited in claim 1 together with the intensive screening configuration (series mode) of the previously pending claim 4.

Consequent to this amendment, claims 3 and 4 are deleted. Claim 2 is amended to be directed to a vibratory screening apparatus including the basket according to claim 1.

Claim 5 is amended for clarity by way of addition of the word “remaining” in the second to last line for consistency.

Claim 6 is canceled, claim 11 is amended to correct a typographical error, and claims 16 and 17 have been amended to recite the vibratory screening apparatus of claim 2.

Claim Rejections 35 U.S.C. §112

It is respectfully submitted that the amended claims are clear. Claim 1 now recites that it is the stack of at least three screen assemblies which is provided with a flow distributor.

It is clear from the application as filed that the function of the flow distributor is to distribute the fluid streams between the screen assemblies depending on the configuration being employed and also to receive fluid streams from flow directing trays as appropriate.

It is explicitly stated in the application as filed that the flow distributor can be provided on the basket, in the static housing or even partly in the static housing and partly on the floating basket. See page 3, lines 1 to 12 of the application as filed. It is also noted that the embodiments shown in the drawings include alternative locations for the flow distributor, either on the static housing or in the basket as shown in Figures 11 to 13 and discussed on page 12, lines 17 to 32.

The subject matter of claim 4 previously pending is now included in claim 1 and has been amended to state explicitly that the first screen assembly is the first remaining screen assembly as suggested by the Examiner.

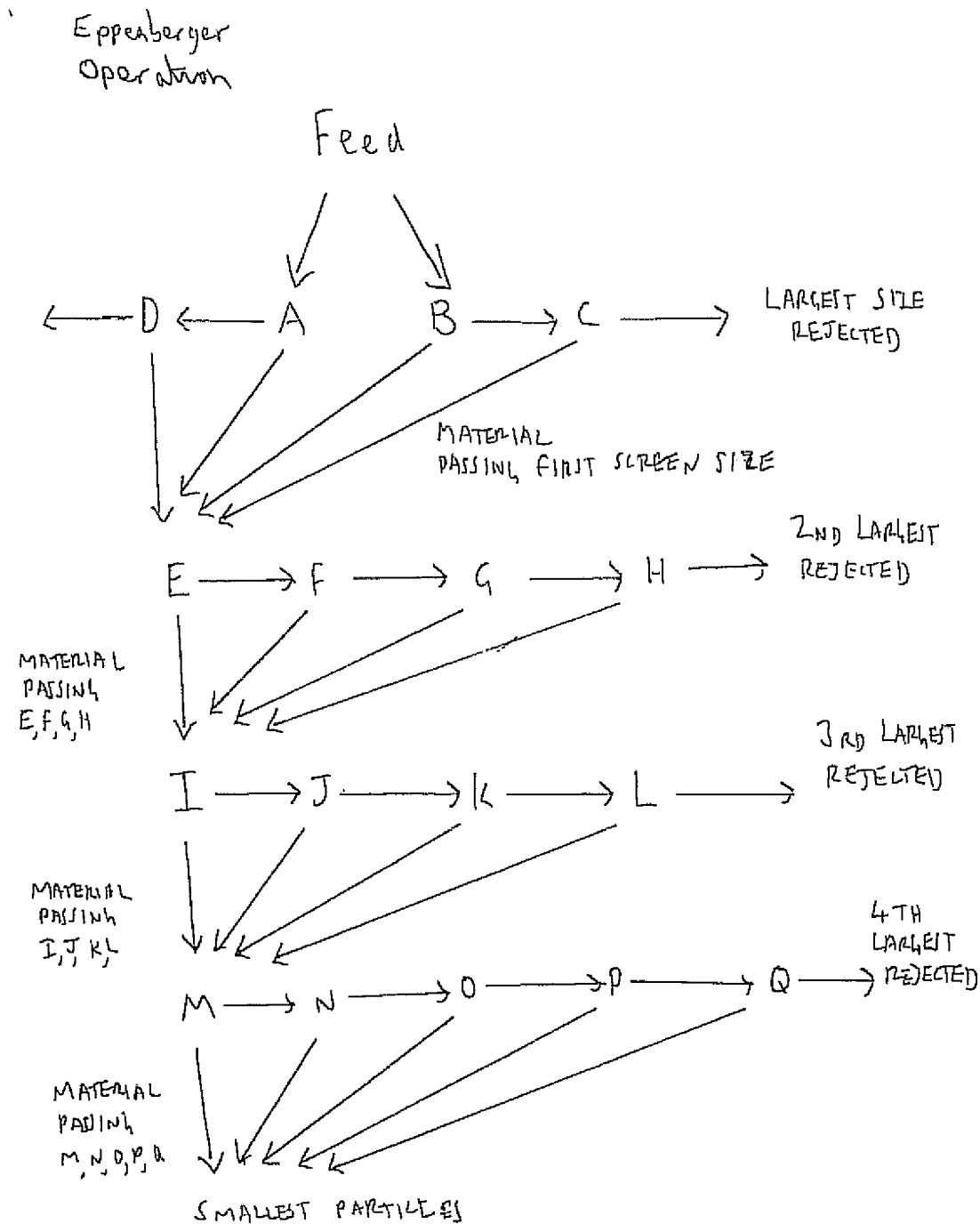
In view of the foregoing, claim 1 and all claims which depend from it overcome the rejection under 35 U.S.C. §112.

Claim Rejections 35 U.S.C. §102

The Examiner rejected a number of the claims previously pending as being anticipated by Eppenberger (US 2,901,109). Eppenberger does not teach a basket having screen assemblies which are provided with a flow distributor which is switchable between the two configurations now recited in claim 1. Specifically Eppenberger does not teach a flow distributor switchable between the parallel and intensive (series) configuration described in claim 1.

In addition it should be noted that with respect to the parallel processing configuration included in claim 1 Eppenberger does not in fact teach such an arrangement.

Eppenberger discloses a device where series screening operations are carried out. The description referred to by the Examiner (column 3, line 22 to line 49) is illustrated on the labeled Figure 1.



As can be seen from the sketch, after the initial division into two parts by a flow distributor, which is not further described, the solids material is successively screened in a series fashion by making use of a second flow divider. Larger particles from screens A and B are passed to screens C and D to allow further separation of any smaller particles that may still be present and

then the largest particles are rejected from the machine. All the materials passing through screens A to D are then passed to screen E and successfully onwards to screens F, G and H. Again, the largest particles not passing through screens E to H are ejected from the machine and the process then continues in a similar fashion through the remaining two banks of screens (I to L and then into Q).

Eppenberger therefore discloses a series screening operation, at least for the particles passing through the screen ("filtrate"), when making use of the flow distributor that is used after the initial division onto screens A and B by some (unspecified) first flow divider. Accordingly, the second flow distributor of Eppenberger does not correspond to the flow distributor as in claim 1.

For the above reasons claim 1 as now presented is both novel and inventive with respect to Eppenberger. For the same reasons claim 13 for a vibratory screening apparatus including the novel and inventive basket of claim 1 is also not anticipated by Eppenberger. Dependent claims are therefore also not anticipated by Eppenberger.

The Examiner suggested that claims 1 to 3, 5 to 10, 14 and 18 were anticipated by Schmidt (US 4,322,288).

Claim 1 as now presented includes the feature of claim 4 that one of the plurality of flow directing configurations is an intensive (series) configuration where filtrate from a primary upper screen assembly is directed onto a first remaining screen assembly and the filtrate from said first said remaining screen assembly is directed onto a second remaining screen assembly (i.e. a series operation).

In the apparatus of Schmidt only parallel processing operation is taught.

Although Schmidt teaches a plurality of flow directing configurations it does not teach a series screening operation as described in the present claim 1. In particular Figure 1 of Schmidt shows a screening operation wherein the filtrate from the upper screen assemblies passes through channel 12 and the moveable collecting pan 20 via its opening 24, before being divided onto the two lower screens 14a and 14b.

When the collecting pan 20 is moved to the second position of Figure 2 the filtrate from the upper screen assemblies is directed via channels 12 and then 54 to exit the machine. At the same time the oversize material (i.e. not the filtrate) from the upper screen assemblies is directed via channel 10 and the opening 22 in the collecting pan 20 onto screens 14a and 14b. Thus Schmidt only teaches parallel processing operations with either the filtrate from the upper screen assembly or the oversize material, not passing through the screen, subsequently divided into two parallel streams.

For the above reasons claim 1 is not anticipated by Schmidt. Consequently the dependent claims and the claims to the vibratory screening apparatus are also not anticipated by Schmidt.

Claim Rejections 35 U.S.C. §103

The Examiner cited Wiseman as showing a basket mounting a stack of screen assemblies but acknowledges that the arrangement shown in Wiseman does not teach at least three screen assemblies.

The Examiner suggests that the addition of third screen assembly is a mere duplication of parts. The Applicant respectfully disagrees. Claim 1 requires a stack of at least three screen assemblies. When operating in the parallel processing configuration the flow distributor of claim 1 receives filtrate from a primary upper screen assembly before dividing it into parallel streams for further screening operations. Making use of a primary filtration through the upper screen

assembly before proceeding to parallel screening operations is a highly advantageous arrangement which provides unanticipated results and is not shown or suggested in the prior art including Wiseman.

The basket of claim 1 used in vibratory screening apparatus is particularly useful. A particular problem noted in the application as filed (page 1, lines 11 to 15) is the very restricted and extremely expensive cost of platform real estate. At the same time there is a need for vibratory screening apparatus, which is highly versatile and able to operate in a number of different drilling situations at different stages of the well drilling operation especially where different types of formation are being drilled through.

The arrangement recited in claim 1 wherein the stack of at least three screen assemblies is provided and the distribution into first and second streams for parallel processing occurs after filtration on a primary upper screen assembly confers at least the following unanticipated advantages.

Firstly by providing an upper screen assembly large particles (from drill cuttings) or any unexpected detritus such as wood or metal components that sometimes find their way into drilling mud fluid, are screened before passing the fluid through the (generally finer) screens of the first and second screen assemblies. This reduces the risk of damage to the, often delicate, first and second screen assemblies, which results in loss of processing capability while repairs are carried out. At the same time the division of the filtrate from the upper screen assembly to the two lower screens maintains the high throughput advantages of parallel processing. By providing a stack of at least three screen assemblies in the basket a highly compact yet efficient screening operation can be carried out, if desired, using only one stack of screen assemblies in a single basket.

This compact arrangement has particular utility in offshore platform oil drilling as discussed in the application as filed (page 1, lines 11 to 15). Indeed the Applicant has achieved considerable commercial success in this highly innovative and competitive field of technology since introducing the apparatus machines to oil well mud recycling operations. The parallel processing method can be used when high volume capacity is required, reducing the number of vibratory screening machines required on an installation. When a series type operation is required the switchable flow distributor allows change of mode without difficulty.

In addition to the cost and space savings achieved operating with fewer machines other advantages are obtained. Many offshore rigs are floating and move with the action of the sea. Where multiple vibratory machines are employed together the accurate equal and consistent distribution of fluid returning from the well to each machine is difficult because of wave motion. Using the method of the invention fewer machines are required (for example 4 rather than 8) and the reduced size of the screening installation makes fluid distribution easier.

Furthermore as noted on page 4, lines 11 to 31 of the application as filed if desired the provision of an upper screen followed by further screening on a lower screen can be used to allow recycling of selected sized solids to the drilling fluid. This option can be retained even when operating in parallel as in the method of claim 1. Passing through a preliminary upper screen allows rejection of over sized material and selection of material that does not pass the first and second screens.

There is no suggestion of such apparatus in the processing of a liquid and solids mixture feed in any of the prior art cited.

None of the cited prior art describes apparatus and methods for separating solids from a liquid and solids mixture feed disclosing the benefit of the use of a primary upper screen

assembly in combination with a flow distributor and parallel processing through first and second screen assemblies.

Where the primary upper screen is a relatively coarse screen and the first and secondary remaining screen assemblies are relatively fine, as is typically employed, processing through the relatively fine screen is slower as the time taken to pass a filtrate through a fine screen and at the same time remove the solids accumulating on the screen is greater than that for a coarse screen.

Therefore the advantages of parallel processing following an initial coarse screening are particularly useful when fine screening is being employed to the solids and liquids mixture feed.

Wiseman teaches parallel or series screening operations but completely fails to appreciate the benefit obtained in passing the mixture feed through a primary upper screen in the same basket before carrying out either series or parallel filtration operations as appropriate to the work being carried out. Claim 1 describes an apparatus that is not only new with respect to Wiseman but has notable advantages that are not obvious when the prior art is considered.

The claims dependent from claim 1 are also not obvious for the same reasons. Claim 2 and its dependents, directed to the vibratory screening apparatus containing the inventive apparatus of claim are also directed to non-obvious subject matter.

Claims 13, 16 and 17 previously presented were objected to on the basis of Wiseman together with the disclosure of US 7,216,768.

As noted above claims 1 and 2 are inventive over Wiseman. Accordingly the dependent claims 13, 16 and 17 are inventive for the same reasons even when the further teachings of US 7,216,768 are considered. The subject matter of these claims provides additional features which even if they are known for their prior art as suggested by the Examiner do not alter the inventiveness derived from the independent claims.

The Examiner suggested that claim 15 previously presented was obvious in the light of Wiseman combined with the teachings of Roff and Muller. As discussed above Wiseman does not teach the basket of claim 1 nor does Wiseman render the basket of claim 1 obvious. The teachings of Roff and Muller with respect to flow distributors attached to the stationary housing and connecting to the basket by means of flexible conduits does not alter the inventiveness of claim 1 or its dependents.

The Information Disclosure Statement

In the Office Action, the Examiner has objected to the previously submitted information disclosure statement on the grounds that it did not include a legible copy of each of the cited foreign patent documents. Applicant respectfully disagrees with the Examiner's characterization of the information disclosure. In the previously submitted information disclosure statement three patents, foreign to the U.S., were identified, namely DE-3015665, EP-1088582 and DE-4210770. The information disclosure statement included a copy of the U.S. Patent 4,322,288, which was the English language equivalent of the DE-3015665 patent. Applicant also submitted an English language abstract of the DE-4210770 patent. In the previous Office Action the Examiner indicated that all references cited in the information disclosure statement except the DE-3015665 reference were considered. In the present Office Action the Examiner has specifically relied upon U.S. Patent 4,322,288 (the Schmidt patent), which as noted above is the English language equivalent of the DE-3015665 patent. Therefore, it appears that all prior art cited in the information disclosure statement has in fact been reviewed by the Examiner and acknowledged on the record. Therefore, Applicant notes that he has in fact fulfilled his duty of disclosure. Should the Examiner require any further information in this regard, he is respectfully requested to contact Applicant's attorney.

Conclusion

In view of the present amendment and remarks, Applicant respectfully submits that all rejections are overcome and the application is now in condition for allowance. Any questions, comments or suggestions the Examiner may have which will place the application in still better condition for allowance should be directed to the undersigned attorney.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 07-1180.

Dated:

Respectfully submitted,

By 

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